EXECUTIVE SUMMARY

Petition for Rulemaking Under the Clean Air Act § 231

Aviation Aerosol Emissions, Aviation-Induced Cloudiness, and the Endangerment of Public Health and Welfare

Submitted to:	U.S. Environmental Protection Agency
Lead Petitioners:	Reinette Senum, GenSeven / SaveOurSkies.org
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Co-Petitioners:	Health Freedom Defense Fund
	Missouri Clean Skies
Authority:	APA, 5 U.S.C. § 553(e); Clean Air Act § 231, 42 U.S.C. § 7571
Response Deadline:	180 days from submission

I. What This Petition Is

This is a formal Petition for Rulemaking submitted to the U.S. Environmental Protection Agency pursuant to the Administrative Procedure Act, 5 U.S.C. § 553(e), and Section 231 of the Clean Air Act (CAA), 42 U.S.C. § 7571. It requests that EPA make a formal endangerment finding for non-CO_2 emissions from commercial aviation and promulgate binding emission and fuel-composition standards to protect public health and welfare. The FAA and Secretary of Transportation are concurrently requested to initiate complementary rulemaking consistent with CAA § 232.

This Petition does not rely on speculative harms or unproven theories. Every factual claim is supported by peer-reviewed science, government data, or the agencies' own documents.

> **In plain English:**
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> *We are formally asking the EPA to do its job. The Clean Air Act — passed in 1970 — requires the agency to set emission standards for aircraft when those emissions endanger public health. This petition presents the scientific and legal evidence that the threshold for action has been crossed, and demands a response within 180 days. Every claim in this document can be traced to a government study, a peer-reviewed journal, or the EPA's own published data.*

II. The Problem

Commercial aviation injects approximately 747 million pounds of sulfur annually into the Upper Troposphere and Lower Stratosphere — along with black carbon, metallic aerosols, and ultrafine particles — with zero binding emission limits of any kind. Jet fuel used in commercial aviation contains up to 200 times more sulfur than diesel truck fuel, which is regulated to 15 parts per million under EPA's Tier 3 standard. Aviation has been exempt from equivalent regulation for sixty years.

In the Stratosphere

Black carbon soot particles have been detected at 18 kilometers altitude — well above commercial flight ceilings — where they catalyze ozone-depleting chemical reactions by the same mechanism the Montreal Protocol was designed to stop. Aviation has chemically bifurcated the Northern and Southern Hemispheres' stratospheres. The EPA estimates the Montreal Protocol will prevent 443 million skin cancers and 2.3 million cancer deaths through 2165. Aviation soot is catalyzing the same chemistry — unregulated.

> **In plain English:**
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> *The Montreal Protocol is the most successful environmental treaty in history — every nation on Earth signed it to stop chemicals from destroying the ozone layer that shields us from the sun's most dangerous radiation. It has saved hundreds of millions of lives. Jet engine soot particles, floating in the stratosphere, trigger the same ozone-destroying chemical reactions that the Protocol was designed to stop — and nobody has ever regulated them.*

Aviation-Induced Cloudiness (AIC)

Man-made cloud cover produced when jet exhaust seeds ice crystal formation now routinely covers up to 10% of sky area in the eastern United States and European flight corridors. High-altitude cloud cover in heavily trafficked corridors has increased 1–3% per decade. No comprehensive monitoring system currently exists capable of distinguishing aviation-induced from naturally occurring cirrus, meaning the true extent of AIC is likely understated.

> **In plain English:**
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> *The white lines behind planes — contrails — do not always disappear. Under the right atmospheric conditions they spread, merge, and grow into vast artificial cloud layers that can cover the sky for hours. Scientists have measured this increase over decades. The sky you see on a busy flight day is not the natural sky. It is partly man-made — and entirely unregulated.*

Weather Modification

AIC alters regional precipitation through two documented mechanisms: over-seeding suppresses rainfall and redistributes moisture downwind; the seeder-feeder mechanism triggers concentrated localized precipitation anomalies. These dual mechanisms provide a measurable physical basis for the rising frequency of droughts and deluges documented across the Northern Hemisphere.

> **In plain English:**
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> *Rain forms when water droplets in clouds combine, get heavy, and fall. Jet exhaust floods the atmosphere with millions of tiny artificial particles that water clings to — so instead of forming a few large drops that fall as rain, the moisture spreads impossibly thin across too many seeds and stays suspended. The region under the flight path gets less rain. That moisture drifts hundreds of miles downwind and eventually dumps all at once somewhere else. Drought here. Deluge there. Both caused by the same unregulated source.*

Solar Dimming

Aviation aerosols scatter sunlight before it reaches the ground. Solar power systems lose up to 37% of output on high-haze days. Photovoltaic reduction of up to 70% has been documented during extreme aerosol events. NOAA scientist Dr. Charles Long concluded in 2015: "We might be actually conducting some unintentional geoengineering here." That finding never appeared on the EPA's contrail or geoengineering pages.

> **In plain English:**
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> *You may have noticed that the sky on busy flight days looks whitish and washed-out rather than deep blue. That is not your imagination. Aviation aerosols scatter sunlight before it reaches the ground — reducing the direct sunlight available for solar panels, crops, and the human body's production of Vitamin D. A government scientist noticed this in 2015 and said publicly that aviation might be conducting unintentional geoengineering. That statement was never acknowledged by the EPA.*

The Wildfire Paradox

Aviation aerosol scattering changes light quality from direct to diffuse, increasing forest canopy density while suppressing evapotranspiration — creating drier, more fire-prone forests. This mechanism contributes to the accelerating intensity and geographic expansion of wildfire events now occurring across the Northern Hemisphere.

> **In plain English:**
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> *When aviation aerosols scatter sunlight from direct to diffuse, forests grow denser — but stop breathing properly. Trees release less moisture into the air. The forest floor gets drier. Dead leaves, branches, and organic material accumulate and dry out faster than normal. The forest looks healthy from above. At ground level it is a tinderbox. More fuel, less moisture, more fire. This is the Wildfire Paradox — and it is one of the least discussed consequences of unregulated aviation aerosol emissions.*

Soil, Water, and Food Supply

Through wet and dry deposition, aviation-emitted sulfates and metals contaminate agricultural soils and watersheds. Airport soils show copper, nickel, lead, and zinc at 1.3 to 3 times background levels. A 2025 study in *Science* found 14–17% of global cropland already exceeds toxic metal thresholds — affecting up to 1.4 billion people. The metals driving that crisis include the same metals documented in aviation exhaust. Aviation's contribution remains entirely unregulated and unquantified.

> **In plain English:**
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> *What goes up at 35,000 feet eventually comes back down. The sulfates and metals in jet exhaust settle onto farmland and into watersheds. Studies of soils near airport runways show toxic metal contamination at up to three times normal background levels — with measurable effects on plant germination. A 2025 study in the journal Science found that nearly one in six acres of global cropland already exceeds safe metal thresholds. The same metals. The same sources. Zero accountability for aviation's share.*

Human Health

Ultrafine particles near airports reach concentrations 100–900% above background extending 18 kilometers downwind — penetrating indoors and crossing the blood-brain barrier. An estimated 74,300 people die annually worldwide from aviation-attributable $PM_{2.5}$ and ozone exposure, per a 2024 MIT and Harvard analysis. US domestic aviation emissions account for 37% of all aviation-attributable $PM_{2.5}$ exposure within the United States. No safe threshold exists.

> **In plain English:**
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> *The particles from jet engines are so small they cannot be filtered by your nose or caught in your upper airways. They go straight into the lungs. The smallest ones cross into the bloodstream. From the bloodstream, they can cross the blood-brain barrier. Studies near Los Angeles airport found toxic particle concentrations up to nine times above normal extending 11 miles downwind — inside homes, with windows closed. Researchers at MIT and Harvard estimate 74,300 people die from aviation-related air pollution every year. There is no safe level of exposure. And there are zero binding federal limits on any of these emissions.*

III. The Legal Basis

The Clean Air Act's Section 231(a)(2)(A) directs that the EPA Administrator shall propose emission standards for aircraft engine emissions that "may reasonably be anticipated to endanger public health or welfare." Under *Loper Bright Enterprises v. Raimondo* (2024), courts must enforce the plain meaning of "shall." The endangerment threshold has been crossed across three independent domains: public health, localized acute toxicity, and welfare.

EPA's own prior actions foreclose the *de minimis* defense. Having made an endangerment finding for lead from piston-engine aircraft (2023) and finalized nvPM standards for turbofan engines (2022), EPA has already conceded that aviation emissions can endanger public health. The remaining 99% of the aviation particle burden demands the same treatment — or a reasoned explanation for the disparity that can survive judicial review.

The February 2026 rescission of the GHG Endangerment Finding does not affect this Petition. The non-CO_2 pollutants addressed here — sulfur oxides, black carbon, metallic aerosols, ultrafine particles, and AIC — are not greenhouse gases. The welfare definition of CAA § 302(h), which independently enumerates weather, visibility, and climate as protected values, remains fully intact.

> **In plain English:**
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> *The law is not ambiguous. The Clean Air Act says the EPA 'shall' set emission standards when aircraft emissions may endanger public health. Not 'may.' Not 'should consider.' Shall. The Supreme Court confirmed in 2024 that courts must enforce plain statutory language. The EPA already admitted aviation emissions are dangerous when it regulated lead from small planes in 2023. It cannot now pretend the rest of aviation's emissions are harmless. The legal case is airtight. What has been missing is someone formally demanding action — in writing, on the record, with a 180-day response deadline. This petition is that demand.*

IV. What We Are Requesting

1. **Endangerment Finding:** A formal finding under CAA § 231(a)(2)(A) that non-CO_2 emissions from civil aircraft engines — including SOx, BC, metallic aerosols, UFP, and AIC — endanger public health and welfare.
2. **Emission and Fuel Standards:** Promulgation of standards including: reduction of aviation turbine fuel sulfur content phased from 500 ppm to 15 ppm; mandatory contrail avoidance protocols including onboard humidity sensors; and deployment of a National Aerosol Registry beginning at the five highest-traffic US airports.
3. **FAA Coordination:** Coordination with the FAA and Secretary of Transportation under CAA § 232 to ensure implementation and compliance, including operational measures within FAA's statutory authority.

> **In plain English:**
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> *Three asks — none of them radical. First: formally declare that these emissions are dangerous, which triggers the legal duty to regulate. Second: apply the same fuel sulfur standard to jet fuel that already applies to diesel trucks — a change that would eliminate 99% of aviation's stratospheric sulfur load. Third: require airlines to use existing technology to avoid forming persistent contrails, and start measuring what is actually in the air near our airports. The technology for all of this already exists. Google and American Airlines already proved contrail avoidance works. The only thing missing is the legal requirement to do it.*

V. The Path Forward

Should EPA fail to act within 180 days, Petitioners intend to seek judicial review under APA § 706(1). Under the *TRAC* factors, the delay is unjustifiable given the documented harm, the clear statutory mandate, and the agency's own prior partial findings conceding the endangerment premise.

The technology exists. The legal authority exists. The scientific record is unambiguous. What has been missing is a formal demand that the agency fulfill its statutory duty.

This Petition is that demand.

> **In plain English:**
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> *If the EPA does not respond within 180 days, we go to federal court. The law is on our side. The science is on our side. The agency's own data is on our side. Sixty years of inaction ends here — one way or another.*